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Preserved wet noodles production

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CN 1269144	A	20001011	CN 99105420	A	19990406	200105 B
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Abstract (Basic): CN 1269144 A

NOVELTY - The production method of fresh-keeping wet noodles includes the following steps: using proper quantity of flour, starch, whole egg powder, gluten powder, edible salt, soda and sodium alginate as raw materials, mixing them with water, kneading, sheeting, curing, rolling, cutting, boiling in water, washing with water, regulating pH value, adding antiadhesive, packaging and steam sterilization so as to obtain finished product which not only retains the nutrients of original noodles and characteristics of hand-rolled noodles, but also possesses smooth appearance, strong toughness, good reconstituability and low production cost. Besides, it has no adhesion and no sourness, and is good in regaining water property.

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Derwent Class: D11

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[12] PUBLIC DESCRIPTION OF INVENTION PATENT APPLICATION

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[72] Inventors: Lu Zanhui, Zhou Yawei, Liu Xiliang	Claims: 1 page, Description: 4 pages, Appended Figures 0 pages

15 [54] Title of Invention: Preparation technology for stay-fresh wet noodles

[57] Abstract

20 This invention announces a technology for preparing stay-fresh wet noodles, characterized by mixing appropriate quantities of such raw materials as wheat flour, starch, whole egg powder, glutelin powder, salt, sodium bicarbonate and

sodium alginate with water, kneading, forming into strips, ripening, rolling, cutting, and then boiling in water, washing in water, adjusting the pH value, adding an anti-sticking agent, packaging and steam sterilizing. By using this
5 technology it is possible to use nationally produced wheat flour for the production of stay-fresh wet noodles without damaging the original nutritional value of the noodles and while preserving the characteristics of traditional home-made
10 noodles, the noodles having a clean and bright appearance, good strength, without sticking and forming sheets, without an acid taste and with good restorability in water; and production costs are lowered.

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Claims

1. Preparation technology for stay-fresh wet noodles using the following processes:

5 (1) Measuring wheat flour, starch, whole egg powder and glutelin powder, thoroughly mixing and then sieving, placing in a vacuum kneading machine; mixing salt, sodium bicarbonate and a quality enhancer with water in certain proportions;

10 (2) Starting the vacuum kneading machine, thoroughly mixing the above-mentioned powder and liquid and forming into a dough, pressing into strips in a compounding machine and placing in a ripener;

15 (3) Leaving the strips in the ripener in an environment of 25°C and 85% humidity for approximately 15 - 45 minutes;

20 (4) Passing the strips through a roller after ripening, where the strips are rolled to the required thickness and then cut to length;

(5) Placing the cut noodles in a pan for a cooking time of 1 - 12 minutes;

25 (6) Washing the cooked noodles in water with a hardness of less than 8° for 1 - 5 minutes at 8 - 25°C and then soaking them in a buffer liquid for 1 - 2 minutes;

30 (7) Adding an anti-sticking agent and packaging in a boiling bag;

35 (8) Sterilizing for 25 - 45 minutes in steam at above 90°C and gradually cooling to room temperature to yield the finished product,

characterized by: the said wheat flour being from nationally produced wheat; the said quality enhancer being sodium alginate; the said anti-sticking agent being edible liquid paraffin; the buffer liquid in the acid soaking process being 5 a mixed solution of lactic acid and sodium lactate.

2. Preparation technology for stay-fresh wet noodles according to Claim 1, characterized by: gluten content in the wheat flour of 26% - 30% (wet basis), ash content ≤ 0.50 (dry basis), forming time 2 - 5 minutes, stabilizing time 7 - 15 minutes, and water absorption rate between 60% and 65%; the pH value of the noodles after soaking in the lactic acid-sodium lactate buffer solution being approximately 4.2; and the pH value of the water for cooking the noodles in the noodle 15 cooking process being 5.5.

3. Preparation technology for stay-fresh wet noodles according to Claim 1, characterized by: sieving and mixing 100 kg of wheat flour, 15 kg of starch, 3 kg of glutelin powder and 0.5 kg of whole egg powder, placing in a vacuum kneading machine and operating for 2 minutes, followed by adding 45.5 kg of water containing (by weight) 3.47% salt, 0.51% sodium bicarbonate and 0.18% sodium alginate and kneading for approximately 13 minutes, placing in a compounding machine to 20 form 2 cm thick strips, placing these in a ripening machine at a humidity of 85% and temperature of 25°C to ripen for 25 minutes, then placing in a rolling machine and rolling by stages to a thickness of 1.2 - 1.3 mm, cutting into 1.5 mm wide threads in a cutting machine and boiling for 1 minute at 30 98°C, washing in water at 12°C for 1 minute and then soaking for 1 minute in a lactic acid-sodium lactate mixed buffer solution at 20°C and pH 2.7, adding 0.3 ml of liquid paraffin, packing into 200 g bags, sterilizing for 35 minutes in steam at 97°C and gradually cooling to room temperature.

4. Preparation technology for stay-fresh wet noodles according to Claim 1, characterized by: sieving and mixing 100 kg of wheat flour, 25 kg of starch and 2 kg of glutelin powder, placing in a vacuum kneading machine and operating for 2 minutes, followed by adding 53 kg of water containing (by weight) 5.8% salt and kneading for approximately 13 minutes, then placing in a compounding machine to form 2 cm thick strips and then placing in a ripening machine at a humidity of 85% and temperature of 25°C and ripening for 25 minutes, placing in a rolling machine and rolling by stages to a thickness of 2.1 - 2.3 mm, cutting into 2.5 mm wide threads in a cutting machine, and boiling for 12 minutes in water at 98°C, washing for 1 minute in water at 12°C, soaking in a mixed buffer solution of lactic acid-sodium lactate at 20°C with a pH of 2.7 for 1 minute, adding 0.3 ml of liquid paraffin, packaging in 200 g bags, sterilizing with steam at 97°C for 35 minutes and gradually cooling to room temperature.

Description**Preparation Technology for Stay-Fresh Wet Noodles**

5 This invention concerns a preparation technology for stay-fresh wet noodles and in particular a preparation technology for stay-fresh wet noodles using nationally produced wheat flour, International Patent Category Number: A23L 1/162.

10 In the last decade, with deep-fried convenience noodles occupying the mainstream of the retail market, people have become increasingly aware of the nutritional deficiencies of deep-fried convenience noodles: nutrition is not balanced; protein, carbohydrate and fat are seriously out of proportion;

15 the fat content is high, readily leading to oxidation rancidity; the saturated fatty acid content of palm oil used for deep frying is too high and readily causes arteriosclerosis and cardiovascular disease; also the oily taste easily makes people become tired of them etc. For the

20 above reasons, Japan first successfully developed stay-fresh wet noodles, also known as LL noodles (long life noodle) or boiled noodles, which are also divided into Chinese drawn noodles and wudong noodles depending on their form. This kind of noodle does not undergo deep-frying in oil or dehydration but is packaged directly after boiling and is then steam sterilized. The appearance and taste are similar to those of traditional home-made noodles, but their storage life at normal temperature can reach over 8 months. The method of use is the same as with deep-fried convenience noodles: they can

25 be eaten after adding the convenience flavouring bag and soaking in water for 3 minutes. The preparation technology for stay-fresh wet noodles has developed rapidly in this country since their introduction from Japan, but as this product makes stringent requirements in terms of raw and supplementary materials, it is difficult for the product indices of all the large noodle factories and starch factories in this country to

satisfy requirements. There is still no technology and experience in processing the special raw materials, and the indices for the raw material wheat flour can only meet the requirements through processing of imported wheat, and so the raw material supply just has to depend on imports. Raw material costs are therefore extremely high, and the product is difficult to promote on the market: the preservation of the noodles requires them to undergo a pH adjustment by soaking in lactic acid which causes the noodles to have a slight acid taste, readily causing the erroneous belief among consumers that the noodles have deteriorated; the noodles readily form sheets leading to poor restorability in water etc., hindering their development in this country.

15 The objective of this invention is to provide a preparation technology for stay-fresh wet noodles which enables the production of stay-fresh wet noodles using nationally produced wheat, processed to form noodles without affecting the quality, and which overcomes the problems of the noodles sticking together in sheets and their slight acid taste. It will thus lower the costs and raise the quality of the product.

20 The technological scheme used to achieve the objective of this invention involves:

(1) Measuring wheat flour, starch, whole egg powder and glutelin powder, thoroughly mixing and then sieving, placing in a vacuum kneading machine; mixing salt, sodium bicarbonate and a quality enhancer with water in certain proportions;

30 (2) Starting the vacuum kneading machine, thoroughly mixing the above-mentioned powder and liquid and forming into a dough, pressing into strips in a compounding machine and placing in a ripener;

(3) Leaving the strips in the ripener in an environment of 25°C and 85% humidity for approximately 15 - 45 minutes;

5 (4) Passing the strips through a roller after ripening, where the strips are rolled to the required thickness and then cut to length

10 (5) Placing the cut noodles in a pan for a cooking time of 1 - 12 minutes;

15 (6) Washing the cooked noodles in water with a hardness of less than 8° for 1 - 5 minutes at 8 - 25°C and then soaking them in a buffer liquid for 1 - 2 minutes;

20 (7) Adding an anti-sticking agent and packaging in a boiling bag;

25 (8) Sterilizing for 25 - 45 minutes in steam at above 90°C and gradually cooling to room temperature to yield the finished product,

characterized by: the said wheat flour being from nationally produced wheat; the said quality enhancer being sodium alginate; the said anti-sticking agent being edible liquid paraffin; the buffer liquid in the acid soaking process being a mixed solution of lactic acid and sodium lactate.

The said wheat flour used has a gluten content of 26% - 30% (wet basis), ash content ≤ 0.50 (dry basis), forming time 2 - 30 5 minutes, stabilizing time 7 - 15 minutes, and water absorption rate between 60% and 65%; the pH value of the noodles after soaking in the lactic acid-sodium lactate buffer solution is approximately 4.2; and the pH value of the water for cooking the noodles in the noodle cooking process is 5.5.

The noodles in this invention are processed from nationally produced hetao wheat, with a gluten content of 26% - 30% (wet basis) and an ash content of less than or equal to 0.50 (dry basis), and the added sodium alginate acts as a quality enhancer. However, the original technology required a gluten content in the wheat flour of over 32% and an ash content of less than or equal to 0.45 (dry basis), and these requirements could only be met by imported wheat. Also, the quality enhancer used was imported karaya gum. The results were less than ideal and solubility difficulties led to the noodles being covered with gum particles making sterilization difficult and resulting in deterioration. The noodle cooking process in this invention involves adjusting the pH of the cooking water to 5.5, which effectively suppresses the solution of the surface starch on the noodles during the cooking process, giving the product a bright and clean appearance and rendering the noodles not easily broken. To prevent the noodles sticking together in sheets during their shelf life, this invention uses edible liquid paraffin in place of sela oil as the anti-sticking agent, improving the restorability in water and palatability of the noodles and preventing the sela oil from becoming rancid and leading to unpleasant tastes and odours and eliminating the anti-oxidant from the original technology, further reducing the oil content of the stay-fresh wet noodles. As edible liquid paraffin is colourless and odourless, the aroma and flavour of the product can be fully realized. The acid soaking process of this invention uses a lactic acid-sodium lactate combined solution in place of the single lactic acid or multiple organic acid mixture of the prior art, which ensures that the pH value of the noodles remains below 4.2 and, without affecting the shelf life, eliminates the slight acid taste of the noodles manufactured by the original technology. Also this combination acid has a stronger buffer performance, thus further stabilizing the product quality.

The following table gives a comparison of this invention with the prior art:

Item	Prior Art	This Invention
Wheat flour	Gluten value 32 - 38%, ash content < 0.45 (dry basis), protein content 8 - 13%, water absorption rate > 60%, stabilizing time > 7 minutes, forming time 2.5 - 3.5 minutes, whiteness > 75, total bacterial count < 1000/g, mean value 60 - 70. Must be processed from imported wheat at a flour price of 3600 - 4800 yuan/ton	Gluten value 26 - 32%, ash content 0.50 (dry basis), protein content 8%, water absorption rate > 60%, stabilizing time > 4 minutes, forming time 2 minutes, whiteness > 70, total bacterial count < 4000/g, mean value 60. Processed from nationally produced hetao wheat at a price of 2800 - 3200 yuan/ton
Edible gum	Imported karaya gum, which is difficult to dissolve, particularly at low temperatures and readily forms small particles in the kneading water, making it difficult to sterilize the central dry part and leading to product deterioration. During production the gum is thoroughly dissolved the day before and used the following day, making microbial reproduction easy. Amount used 1.5% at a price of 80 yuan/kg.	Nationally produced sodium alginate, readily soluble with little temperature dependence, at the time of use is stirred with a high-speed cutting machine and can be used immediately, making the production operation convenient, and comparative tests have shown its results to be far superior to karaya gum, amount used 1.5% at a price of 53 yuan/kg.

Edible acid	Lactic acid. The organic acid with the faintest acid taste, but being a single acid it has no buffering capability, and so pH variations in production are fairly large and difficult to control, making stringent requirements on the operation, and the noodles have a fairly strong acid taste.	Lactic acid and sodium lactate combination forming a buffer system, so that the pH value is stable and easily controlled in operation. Stable pH value in product, product quality uniform and acid taste milder than with lactic acid alone.
Anti-sticking agent	The prior art uses 2 ml of sela oil to each 200 g of noodles to prevent sticking, it has a peanut oil flavour and in about 1 month produces a rancid taste. In production it is usually necessary to add a fatty antioxidant, which does not accord with the health and nutritional objectives of the noodles. Sela oil has a price of 8.8 yuan/kg.	This invention uses edible liquid paraffin at 0.3 ml per 200 g of noodles, and its anti-sticking properties are extremely good. Also liquid paraffin is completely stable and is non-toxic and non-injurious to humans and at the same time lowers the oil content of the noodles, so that the taste and aroma of the noodles are very clean and crisp. Edible liquid paraffin has a price of 10 yuan/kg.
Product assessment	Smooth, crisp and pliable, appropriate to Japanese custom.	Good elasticity, sinewy, chewy, meeting the requirements of Chinese people for a traditional noodle flavour.

Summarizing the above, this invention has the following advantages compared with the prior art:

1. LL noodle production is no longer limited by the level of raw material quality;
2. Costs are low. Sodium alginate is easier to use in production and is cheaper, operation is convenient, and the results are significantly better than with karaya gum;
3. Aimed at the shortcomings of LL noodles whereby the taste is too acid and pH adjustment tends to be too high, using a combined acid in place of the single lactic acid utilizes its buffering action to lower the acid taste of the noodles, the pH of the finished product is stable, and its results, on suppressing microbial activity, are significant;
4. Using edible liquid paraffin in place of sela oil gives significant anti-sticking results ensuring that the noodles do not stick together during the shelf life, so that they do not easily break at the time of use and do not stick together to form sheets during storage. More importantly it eliminates the rancid taste of sela oil, so that the taste is clean and crisp without oiliness.

The detailed content of this invention and practical examples follow:

1. The wheat flour, starch, whole egg powder and glutelin powder are measured, thoroughly mixed and then sieved, and placed in a vacuum kneading machine; salt, sodium bicarbonate and a quality enhancer are mixed with water in certain proportions.
2. The vacuum kneading machine is started, and the abovementioned powder and liquid are formed into a dough,

pressed into strips in a compounding machine and placed in a ripener.

3. The strips are left in the ripener in an environment of
5 constant temperature and humidity for approximately 15 - 45 minutes to ensure that their water content distribution is uniform and that the protein in the noodle strands is fully formed. At the same time, the ultraviolet lamp at the top of the ripener has a sterilizing action on the surface of the
10 strips.

4. After ripening, the strips are passed continuously through a rolling machine, where they are rolled to the required thickness in 4 - 5 passes and then cut to length.
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5. The cut noodles are immediately placed in a pan in the proportion of cooking water to noodles of approximately 8 - 15 : 1. The pH of the cooking water is approximately 0 - 5.5, and the cooking time is 1 - 15 minutes.
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6. The cooked noodles are washed in water with a hardness of less than 2° for 1 - 5 minutes at 8 - 25°C and then soaked in a mixed buffer solution of lactic acid and sodium lactate for 1 - 5 minutes.
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7. Approximately 0.1 - 0.5 ml of edible liquid paraffin is added, followed by packaging in a boiling bag.

8. They are sterilized for 25 - 45 minutes in steam at above 30 90°C and gradually cooled to room temperature to yield the finished product.

The wheat flour mentioned above is nationally produced hexao wheat, with a gluten content of 26% - 30% (wet basis), ash content ≤ 0.50 (dry basis), forming time 2 - 5 minutes, stabilizing time 7 - 15 minutes, water absorption rate 60% -
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65%; the said boiling bag is made from a composite film of BOPP and nylon or other boiling-resistant, non-toxic, high-strength plastic composite film.

5 Practical Example 1:

100 kg of wheat flour, 15 kg of starch, 3 kg of glutelin powder and 0.5 kg of whole egg powder were sieved and mixed and placed in a vacuum kneading machine. This was operated for 2 minutes, after which 45.5 kg of water containing (by weight) 3.47% salt, 0.51% sodium bicarbonate and 0.18% sodium alginic acid was added, and the mixture was kneaded for approximately 13 minutes and placed in a compounding machine to form 2 cm thick strips. These were placed in a ripening machine at a humidity of 85% and temperature of 25°C to ripen for 25 minutes. They were then placed in a rolling machine and rolled by stages to a thickness of 1.2 - 1.3 mm and then cut into 1.5 mm wide threads in a cutting machine. They were boiled for 1 minute at 98°C, washed in water at 12°C for 1 minute and then soaked for 1 minute in a lactic acid-sodium lactate mixed buffer solution at 20°C and pH 2.7. 0.3 ml of liquid paraffin was added, and the noodles were packed into 200 g bags and sterilized for 35 minutes in steam at 97°C and gradually cooled to room temperature. At the time of eating, the flavourings are added, and the noodles are soaked in tap water for 3 minutes and can then be eaten. After keeping at normal temperature for 8 months, the bags were opened and the contents examined and tasted. The product was still fresh with no deterioration. Colour, lustre and flavour were normal.

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Practical Example 2:

100 kg of wheat flour, 25 kg of starch and 2 kg of glutelin powder were sieved and mixed and placed in a vacuum kneading machine. This was operated for 2 minutes, after which 53 kg

of water containing (by weight) 5.8% salt was added, and the mixture was kneaded for approximately 13 minutes and placed in a compounding machine to form 2 cm thick strips. These were placed in a ripening machine at a humidity of 85% and 5 temperature of 25°C to ripen for 25 minutes. They were then placed in a rolling machine and rolled by stages to a thickness of 2.1 - 2.3 mm and cut into 2.5 mm wide threads in a cutting machine. They were boiled for 12 minutes at 98°C, washed in water at 12°C for 1 minute and then soaked for 1 10 minute in a lactic acid-sodium lactate mixed buffer solution at 20°C and pH 2.7. 0.3 ml of liquid paraffin was added, and the noodles were packed into 200 g bags and sterilized for 35 minutes in steam at 97°C and gradually cooled to room temperature. At the time of eating, the flavourings are added, 15 and the noodles are soaked in tap water for 3 minutes and can then be eaten. After keeping at normal temperature for 8 months, the bags were opened and the contents examined and tasted. The product was still fresh with no deterioration. Colour, lustre and flavour were normal.

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Practical experience has shown that the objectives of the invention have been fully met.

Translator's Report/Comments

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In translating the above text we have noted the following:

Page/para/line*	Comment
passim	The term "sela" oil has not been identified, but it is possible that it is a transliteration of "cera".

* This identification refers to the source text. Please note that the first paragraph is taken to be, where relevant, the end portion of a paragraph starting on the preceding page. Where the paragraph is stated, the line number relates to the particular paragraph. Where no paragraph is stated, the line number refers to the page margin line number.

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